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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
LUND, JEFFRIE ROBERT				
ART UNIT		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/663,789

Applicant(s)

SONNENSCHIN, RAYMUND

Examiner

Jeffrie R. Lund

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 17-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16, 27 and 28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB-08)
- Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claims 3 and 27 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The amendment to claim 1 requires a turbulence barrier positioned in the reactor casing so that the gases can pass to the outlet (i.e. upstream of the outlet). Therefore, claims 3 and 27, which require a turbulence barrier up stream of said outlet, do not further limit claim 1.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-16, 27, and 28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The newly added limitation "labyrinth as part of the reactor casing" is not taught or suggested in the specification or drawings. The Examiner agrees that there is support in the figures for a "labyrinth" but not for a labyrinth as part of the reactor casing.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4, 6-13, 15, 16, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kordina et al, US Patent 5,704,985, and Sumnitsch, US Patent 4,903,717.

Kordina et al teaches a device that includes: a cup composed of a graphite tube susceptor 7' coated with SiC (SiC includes silicon) forming the walls of the cup having two openings, and a vertically movable SiC substrate base (SiC includes silicon) 13' oriented in the direction of the force of gravity, with an outer diameter equal to the outer diameter of the tube; heater 11 for heating the cup which includes a temperature control unit with a pyrometer for heating the base and cup; a SiC substance-adding unit 15' having a substance feed line, a metering unit, and a substance outlet oriented in the direction opposite to the direction force of gravity and projecting into the cup; a gas-conveying unit connected down stream of the outlet; a gas tight, vacuum and pressure resistant reactor casing 2; a gas tight cover 3, 4; an outlet 16 connected to a gas-conveying unit (pump) down stream of the outlet (not shown); a turbulence barrier 14' upstream of the outlet. The substrate base is suitable for depositing polycrystalline silicon thereon. Kordina et al also teaches that the apparatus can deposit any crystalline materials and the cup should be made of the material being deposited. (Entire

document, specifically, figure 3) The Examiner notes that the open language of the claims (comprising or comprised) only requires that the silicon parts include silicon and does not limit other material combined with the silicon. Thus the claims read on any material that also contains silicon, such as SiC.

Kordina et al differs from the present invention in that Kordina et al does not teach that the substance-adding unit is oriented with a substance outlet in the direction of the force of gravity, a turbulence barrier labyrinth as part of the reactor casing, or the size of the cup and base.

Sumnitsch teaches a processing chamber 20 with a substance outlet 42 in the direction of the force of gravity and a turbulence barrier labyrinth as part of the reactor casing (see figure 3).

The motivation for inverting the apparatus of Kordina et al such that the substance-adding unit is oriented with a substance outlet in the direction of the force of gravity is to provide an alternate and equivalent means of orienting the chamber as taught by Sumnitsch. Furthermore, it has been held that the reversal of parts is obvious. (*In re Gazda*, 219 F.2d 449, 104 USPQ 400 (CCPA 1955))

The motivation for making the turbulence barrier of Kordina et al a labyrinth is to trap particles in the gas stream as taught by Sumnitsch and to control and limit the flow of gas through the exhaust system as is well known in the art.

The motivation for making the cup and base a specific size is to optimize the cup and base of Kordina et al. Furthermore, it was held in *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ

232 (1984), by the Federal Circuit that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. (Also see MPEP 2144.04 (d))

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to invert the apparatus of Kordina et al such that the substance-adding unit is oriented with a substance outlet in the direction of the force of gravity and add a turbulent barrier labyrinth as taught by Sumnitsch, and to optimize the size of the cup and base of Kordina et al.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kordina et al and Sumnitsch as applied to claims 1-4, 6-13, 15, 16, 27, and 28 above, and further in view of Goela et al, US Patent 5,604,151.

Kordina et al and Sumnitsch differ from the present invention in that they do not teach that the outlet is connected to a gas-conveying unit with a dust separator.

Goela et al teaches a deposition chamber that includes: a substance-adding unit 22 is oriented with a substance outlet in the direction of the force of gravity and extending into the cup 18, and a gas-conveying unit 52 that includes a dust separator 60. (Figure 1)

The motivation for adding a gas-conveying unit and dust separator to the apparatus of Kordina et al and Sumnitsch is to provide a required but not disclosed means of evacuating the reactor casing as taught by Goela et al. The motivation for

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adding the dust separator to the apparatus of Kordina et al and Sumnitsch is to remove the dust from the exhaust to prevent damaging the gas-conveying unit as taught by Goela et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the gas-conveying unit and dust separator of Goela et al to the apparatus of Kordina et al and Sumnitsch.

7. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kordina et al and Sumnitsch as applied to claims 1-4, 6-13, 15, 16, 27, and 28 above, and further in view of Padovani, US Patent 4,207,360.

Kordina et al and Sumnitsch differ from the present invention in that they do not teach that the reactor casing is equipped with a cooler.

Padovani teaches a coating device that includes a casing 15 with inductive heating coils 21, 22 and cooling coils 20. (Figure 2)

The motivation for adding a cooler to the casing of Kordina et al and Sumnitsch is to maintain the temperature of the casing at the proper temperature as taught by Padovani (column 3 lines 60-66).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the cooler of Padovani to the apparatus of Kordina et al and Sumnitsch.

8. Claims 1-13, 15, 16, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kordina et al, US Patent 5,704,985, in view of Goela et al, US Patent 5,604,151, and Sumnitsch, US Patent 4,903,717.

Kordina et al was discussed above.

Kordina et al differs from the present invention in that Kordina et al does not teach that the substance-adding unit is oriented with a substance outlet in the direction of the force of gravity, a turbulence barrier labyrinth as part of the reactor casing, or the size of the cup and base.

Goela et al teaches a deposition chamber that includes: a substance-adding unit 22 is oriented with a substance outlet in the direction of the force of gravity and extending into the cup 18, and a gas-conveying unit 52 that includes a dust separator 60. (Figure 1)

Sumnitsch teaches a processing chamber 20 with a substance outlet 42 in the direction of the force of gravity and a turbulence barrier labyrinth as part of the reactor casing (see figure 3).

The motivation for orienting the substance-adding unit with a substance outlet in the direction of the force of gravity is to provide an alternate and equivalent means of orienting the substance-adding unit as taught by Goela et al and Sumnitsch. Furthermore, it has been held that the reversal of parts is obvious. (*In re Gazda*, 219 F.2d 449, 104 USPQ 400 (CCPA 1955))

The motivation for making the turbulence barrier of Kordina et al a labyrinth is to trap particles in the gas stream as taught by Sumnitsch and to control and limit the flow of gas through the exhaust system as is well known in the art.

The motivation for adding a gas-conveying unit to the apparatus of Kordina et al is to provide a specific gas-conveying unit as required by Kordina et al but not shown.

The motivation for adding the dust separator to the apparatus of Kordina et al is to remove the dust from the exhaust to prevent damaging the gas-conveying unit as taught by Goela et al.

The motivation for making the cup and base a specific size is to optimize the cup and base of Kordina et al and Goela et al. Furthermore, it was held in *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), by the Federal Circuit that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. (Also see MPEP 2144.04 (d))

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to orient the substance-adding unit of Kordina et al with a substance outlet in the direction of the force of gravity as taught by Goela et al and Sumnitsch; add a turbulent barrier labyrinth as taught by Sumnitsch; add the gas-conveying unit and dust separator of Goela et al to the apparatus of Kordina et al; and to optimize the size of the cup and base of Kordina et al and Goela et al.

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kordina et al, Goela et al, and Sumnitsch as applied to claims 1-13, 15, 16, 27 and 28 above, and further in view of Padovani, US Patent 4,207,360.

Kordina et al, Goela et al, and Sumnitsch differ from the present invention in that they do not teach that the reactor casing is equipped with a cooler.

Padovani teaches a coating device that includes a casing 15 with inductive heating coils 21, 22 and cooling coils 20. (Figure 2)

The motivation for adding a cooler to the casing of Kordina et al, Goela et al, and Sumnitsch is to maintain the temperature of the casing at the proper temperature as taught by Padovani (column 3 lines 60-66).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the cooler of Padovani to the apparatus of Kordina et al, Goela et al, and Sumnitsch.

10. Claims 1-4, 6-13, 15, 16, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kordina et al, US Patent 5,704,985, in view of Maruyama et al US Patent 6,001,175, and Sumnitsch, US Patent 4,903,717.

Kordina et al was discussed above.

Kordina et al differs from the present invention in that Kordina et al does not teach that the tube, base, and substance-adding unit are made only of silicon; a substance outlet in the direction of the force of gravity; a turbulence barrier labyrinth as part of the reactor casing; or the size of the cup and base.

Maruyama et al teaches that a high-purity carbon (graphite) susceptor coated with silicon carbide (SiC) is equivalent to a low resistivity silicon substrate susceptor (Column 21 lines 58-64), and a substance-adding unit with a substance outlet 7 oriented in the direction of the force of gravity (figure 1).

Sumnitsch teaches a processing chamber 20 with a substance outlet 42 in the direction of the force of gravity and a turbulence barrier labyrinth as part of the reactor

casing (see figure 3).

The motivation for replacing the susceptor, base, and substance-adding unit made of SiC coated graphite of Kordina et al with a silicon susceptor, base, and substance-adding unit is to provide an alternate and equivalent material from which to make the susceptor, base, and substance-adding unit, and to prevent the contamination of the deposited material by carbon from the SiC coated carbon susceptor, base, and substance-adding unit as taught by Maruyama et al. Furthermore, it has been held that: the selection of a known material based on its suitability for its intended use is prima facie obviousness (*Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945)); and reading a list and selecting a known compound to meet known requirements is no more ingenious than selecting the last piece to put in the last opening in a jig-saw puzzle (325 U.S. at 335, 65 USPQ at 301).

The motivation for orienting the substance-adding unit with a substance outlet in the direction of the force of gravity is to provide an alternate and equivalent means of orienting the substance-adding unit as taught by Maruyama et al and Sumnitsch. Furthermore, it has been held that the reversal of parts is obvious. (*In re Gazda*, 219 F.2d 449, 104 USPQ 400 (CCPA 1955))

The motivation for making the turbulence barrier of Kordina et al a labyrinth is to trap particles in the gas stream as taught by Sumnitsch and to control and limit the flow of gas through the exhaust system as is well known in the art.

The motivation for making the cup and base a specific size is to optimize the cup and base of Kordina et al. Furthermore, it was held in *Gardner v. TEC Systems, Inc.*,

725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), by the Federal Circuit that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. (Also see MPEP 2144.04 (d))

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the carbon coated SiC susceptor, base, and substance-adding unit of Kordina et al with a silicon susceptor, base, and substance-adding unit as taught by Maruyama et al; orient the substance-adding unit of Kordina et al such that the substance-adding unit is oriented with a substance outlet in the direction of the force of gravity as taught by Maruyama et al; add a turbulent barrier labyrinth as taught by Sumnitsch; and to optimize the size of the cup and base of Kordina et al and Maruyama et al.

11. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kordina et al, Maruyama et al, and Sumnitsch as applied to claims 1-4, 6-13, 15, 16, 27, and 28 above, and further in view of Goela et al, US Patent 5,604,151.

Kordina et al, Maruyama et al, and Sumnitsch differ from the present invention in that they do not teach that the outlet is connected to a gas-conveying unit with a dust separator.

Goela et al teaches a deposition chamber that includes: a substance-adding unit 22 is oriented with a substance outlet in the direction of the force of gravity and

extending into the cup 18, and a gas-conveying unit 52 that includes a dust separator 60. (Figure 1)

The motivation for adding a gas-conveying unit and dust separator to the apparatus of Kordina et al, Maruyama et al, and Sumnitsch is to provide a required but not disclosed means of evacuating the reactor casing as taught by Goela et al. The motivation for adding the dust separator to the apparatus of Kordina et al, Maruyama et al, and Sumnitsch is to remove the dust from the exhaust to prevent damaging the gas-conveying unit as taught by Goela et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the gas-conveying unit and dust separator of Goela et al to the apparatus of Kordina et al, Maruyama et al, and Sumnitsch.

12. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kordina et al, Maruyama et al, and Sumnitsch as applied to claims 1-4, 6-13, 15, 16, 27, and 28 above, and further in view of Padovani, US Patent 4,207,360.

Kordina et al, Maruyama et al, and Sumnitsch differ from the present invention in that they do not teach that the reactor casing is equipped with a cooler.

Padovani teaches a coating device that includes a casing 15 with inductive heating coils 21, 22 and cooling coils 20. (Figure 2)

The motivation for adding a cooler to the casing of Kordina et al, Maruyama et al, and Sumnitsch is to maintain the temperature of the casing at the proper temperature as taught by Padovani (column 3 lines 60-66).

Therefore it would have been obvious to one of ordinary skill in the art at the time

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the invention was made to add the cooler of Padovani to the apparatus of Kordina et al, Maruyama et al, and Sumnitsch.

Response to Arguments

13. Applicant's arguments with respect to claims 1-16, 27, and 28 have been considered but are moot in view of the new ground(s) of rejection. The newly added limitations are discussed above.

14. Applicant's arguments filed September 25, 2007 have been fully considered but they are not persuasive.

In regard to the argument that:

The devices described in the cited references are arranged in a manner that is different from that claimed. Moreover, those devices because they are designed and optimized for specific purposes other than the preparation of polycrystalline silicon as described in this application would not have been modified to yield the claimed device. In particular, as noted above, the device of Kordina is oriented in a different direction than that being claimed AND the set up for gas flow and output is entirely different from that of Kordina.

The Examiner disagrees. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. All of the cited references are capable of forming polycrystalline silicon.

In regard to the argument that:

Applicants respectfully disagree with the Examiner's conclusion on this basis because there is simply no motivation to substitute any of the materials from the Kordina et al patent with silicon as described in this patent publication. This is particularly true in light of the fact that Kordina et al requires SiC and it is improper to go directly against the explicit teachings of the prior art when raising an obviousness rejection. Moreover, there is nothing in the references which specifically suggest using high purity silicon in the Kordina et al devices because they are designed and optimized for specific purposes other than the preparation of polycrystalline silicon as described in this application.

The Examiner disagrees. Kordina et al is not limited to SiC. Kordina et al

specifically teaches that the walls of Kordina et al can be made SiC, an alloy of SiC and the material being grown (deposited) or the material grown (Claims 2 and 8) and is used to grow crystal material containing silicon. Maruyama et al teaches the equivalence of graphite coated susceptors and silicon susceptors.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-1437. The examiner can normally be reached on Monday-Thursday (10:00 am - 9:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jeffrie R. Lund/
Primary Examiner, Art Unit 1792

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